

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Amendment of Part 101 of the)	WT Docket No. 10-153
Commission's Rules to Facilitate the Use of)	
Microwave for Wireless Backhaul and)	
Other Uses and to Provide Additional)	
Flexibility to Broadcast Auxiliary Service)	
and Operational Fixed Microwave)	
Licensees)	
)	
Request for Interpretation of Section)	WT Docket No. 09-106
101.141(a)(3) of the Commission's Rules)	
Filed by Alcatel-Lucent, Inc., <i>et al.</i>)	
)	
Petition for Declaratory Ruling Filed by)	WT Docket No. 07-121
Wireless Strategies, Inc.)	
)	
Request for Temporary Waiver of Section)	
101.141(a)(3) of the Commission's Rules)	
Filed by Fixed Wireless Communications)	
Coalition)	

COMMENTS OF WCAI



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1333 H Street
Suite 700 West
Washington, DC 20005
(202) 452-7823

The Wireless Communications Association International (WCAI), the trade association of the wireless broadband industry, submits these comments on the Commission's Notice of Proposed Rulemaking and Notice of Inquiry in this proceeding.¹ Although WCAI does not comment specifically on the issues raised in the NPRM, WCAI does offer some suggestions for the FCC to consider as part of the NOI process.

Low-Frequency Backhaul. The high cost and difficulty of constructing and deploying new backhaul and middle mile facilities – especially in rural and remote tribal areas – is rapidly becoming a barrier to the widespread availability of affordable broadband services. The transition to next generation mobile wireless broadband technologies with bandwidth capabilities per base station in the range of 100 to 300 Mbps is rapidly rendering today's backhaul solutions, such as T1 lines, obsolete.² Without adequate backhaul and middle mile capacity, the throughput otherwise available on 4G networks will not be realized. And because today's typical backhaul networks are unable to adequately support next-generation 4G mobile wireless broadband technologies, entirely new backhaul networks must be built.³ Fiber and high-frequency fixed wireless provide adequate 4G backhaul solutions in urban areas. In rural areas, however, the cost of currently available 4G backhaul solutions is problematic due to the high cost of bridging the great distances that often exist between local networks and access points. Making a limited number of DTV white spaces channels available for

¹ *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees*, Notice of Proposed Rulemaking and Notice of Inquiry, 25 FCC Rcd 11246 (2010) ("NPRM" and "NOI").

² See Dr. Alan Solheim, *Choosing the Backhaul for LTE*, 4G Wireless Evolution (Mar. 13, 2009) (available at <http://4g-wirelessevolution.tmcnet.com/topics/4g-wirelessevolution/articles/52237-choosing-backhaul-lte.htm>).

³ *Id.*

fixed wireless backhaul would increase the availability of affordable backhaul solutions where low cost backhaul is most needed – in rural and remote tribal areas.

Fiber does not provide an economic solution in all cases. Where it can be economically installed, fiber is an excellent choice for backhaul. However, due to fiber's relatively high cost and lengthy installation, fixed wireless is often a more attractive alternative. Fiber installation costs range from \$10 to \$40 per foot for rural and suburban areas and range from \$50 to \$200 per foot in dense urban areas.⁴ In a typical American metro deployment, the average connection length ranges from 10,000 and 20,000 feet.⁵ Even taking the low end of the scales for cost and length, fiber build out cost per site in such areas is on the order of \$300,000 before any electronics are placed at the end of the fiber to provide capacity.⁶ A microwave link, including hardware, installation, and an allocation for operations cost over the life of the link would be on the order of *10 times lower cost*.⁷

The Achilles heel for microwave links in rural areas is range and antenna size, which are largely a function of the spectrum bands that are currently available for fixed links. A single fixed wireless link using a 3-foot or smaller antenna in the 11 GHz band typically may cover distances from less than a mile up to 7 miles. In the 6 GHz band a carrier-grade link may be established at up to 20 miles with a single radio pair, though that requires 6-foot or taller dishes, which in turn require very sturdy towers. Covering

⁴ Solheim, *Choosing the Backhaul for LTE*, *supra* note 2.

⁵ *Id.*

⁶ *Id.*

⁷ *Id.*

distances of 50 to 100 miles requires multiple microwave links and towers, which is a significant obstacle in most cases.

These limitations could be overcome by using the DTV white spaces for backhaul in rural and remote tribal areas. A 100-mile fixed wireless backhaul connection using the white spaces would typically cost less than \$200,000 to construct. The same connection using 6 GHz spectrum would likely cost more than \$3 million, more than *15 times* as much. At this distance, a new fiber build would be at least 20 to 30 times more expensive and would take much longer to build than a fixed wireless link, which can often be installed in a matter of days. The relative economics of these 4G backhaul solutions demonstrates the efficacy of DTV backhaul where long distances must be covered.

DTV backhaul is feasible without compromising the needs of other licensed and unlicensed spectrum users in the band. Ample low-frequency DTV white spaces spectrum exists in rural and remote tribal areas to accommodate wireless backhaul and other uses. Typically, rural and remote tribal areas possess anywhere from 15 to 48 vacant TV white space channels. Given the vast number of available channels, and assuming channel separation is employed, DTV backhaul could be authorized without interfering with unlicensed or other uses of the band.

If a fixed, licensed regime were authorized in a portion of the DTV white spaces, one of the primary obstacles to rural broadband deployment – backhaul and middle mile transport – would be largely overcome. Accordingly, WCAI urges the Commission to initiate a proceeding to make available low-frequency backhaul.

Zoning. The deployment of wireless infrastructure is often challenging. Local zoning restrictions in particular present significant barriers to infrastructure deployment and discourage additional investment. This is true even when local zoning officials lack the authority to act. For example, the Commission’s Over-the-Air Reception Device (OTARD) rule⁸ protects fixed wireless devices and satellite receivers one meter or less in diameter from governmental and private restrictions on their placement and use. Local zoning authorities, private landlords, and homeowner associations nevertheless regularly ignore the rule – even where they honor it for satellite dishes. To encourage compliance with its regulations, the Commission should work to educate the public regarding the applicability of the OTARD rule to fixed wireless devices. The Commission should also issue a declaratory ruling that laws, contractual provisions, or other requirements mandating pre-approval for the placement of fixed wireless antennas, including backhaul antennas, less than one meter in diameter “impair” the “installation, maintenance, or use” of such antennas under the OTARD rule. Clear guidance on these issues could make a significant difference in the utility of the OTARD rule.

Respectfully submitted,

WCAI

By: /s/ Fred Campbell

Fred Campbell
President & CEO
1333 H Street, NW, Suite 700 West
Washington, DC 20005
202.452.7823

⁸ See 47 C.F.R. § 1.4000.